

REMARKS

Applicant has carefully reviewed the Office Action mailed May 4, 2007 and offers the following remarks to accompany the above amendments.

Claims 28-30 have been amended to correct an inadvertent typographical error. Claims 28-30 are the same as original claims 6, 15, and 24. Claims 19-27 were rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter. Applicant has amended claim 19 to recite that the computer readable medium is encoded with a computer program comprising instructions to instruct a processor to perform a certain function. Claims 23 and 26 have also been amended. Under the “Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility,” a claimed computer readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer’s functionality to be realized and is thus statutory (“Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility,” November 22, 2005, 1300 O.G. 142, Annex IV, “Computer-Related Nonstatutory Subject Matter”). Thus, based on the Interim Guidelines, claim 19 as amended is directed to statutory subject matter. Accordingly, the rejection of claims 19-27 under 35 U.S.C. § 101 as being directed to non-statutory subject matter should be withdrawn.

Claims 1-5, 7-14, 16-23, and 25-27 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,895,010 B1 to Chang et al. (hereinafter “Chang”). Applicant respectfully traverses. For a reference to be anticipatory, the reference must disclose each and every claim element. Further, the elements of the reference must be arranged as claimed. MPEP § 2131. The requirement that each and every element be disclosed in the manner claimed is a rigorous standard that the Patent Office has not met in this case.

Before addressing these rejections, Applicant provides an overview of the present invention so that the present invention can be properly compared to the prior art. The present invention provides a fast and efficient retransmission technique, which allows a link control layer to request retransmission of frames upon receiving information from an underlying physical layer that an unsuccessful attempt to transmit data was detected. In general, a failed attempt to transmit a frame is detected at a physical layer of a receiver. In response, the physical layer of the receiver sends a message to a link control layer of the receiver to indicate the failed attempt

to transmit a frame was detected. Upon receipt of the message, the link control layer sends a retransmission message to a corresponding link control layer of a sender. The retransmission message is configured to cause the sender to retransmit the unrecoverable data associated with the corrupted frame.

In one embodiment, the link control layer implements a Radio Link Protocol (RLP) using an RLP entity associated with an application running on the receiver. The frames transmitted within the receiver are physical layer frames encapsulating all or a portion of one or more link control layer frames, which further encapsulate data provided from the applications. Accordingly, the retransmission message includes information identifying data or link control layer frames that have not been received by the receiver. Further, the message provided by the physical layer upon detecting a failed attempt to transmit a frame may be a primitive indicative of a failed attempt to receive frames in the physical layer. The retransmission message may be a negative acknowledgement (NAK) message. During operation, the sender will receive the retransmission message at a link control layer; determine the data or a link control layer frame to retransmit; and retransmit the data or link control layer frame requiring retransmission.

In one embodiment, the present invention provides a QoS-based solution, which cooperates with the physical layer of the receiver to provide faster detection of lost or corrupt frames. RLP frames need to be retransmitted in two different situations. In the first case, the transmitted RLP frames are totally lost and the receiver cannot detect any signal. In the second and most common case, enough of the transmitted signal can be received to indicate a MAC frame was transmitted, but not properly decoded. For the latter scenario, the physical layer can send a primitive, or like signal, to the RLP entity to inform it that an attempt to transmit a frame was made, but the frame was not properly received. An existing primitive capable of providing such information is the primitive used to calculate frame error rates and ultimately control transmit-power levels. Upon receiving the primitive from the physical layer, the receiver's RLP entity will create and send an ACK message to the sender's RLP entity. In response, the sender's RLP entity will retransmit the last RLP frame or frames much more quickly than when using the other available solutions.

In contrast, Chang discloses a method for transmitting and receiving data according to RLP without an RLP frame failing due to errors in the physical channel (Chang, col. 2, lines 62-65). The receiving RLP processor requests the transmitting RLP processor to retransmit a failing

RTP frame assigned with a new identifier determined by the receiving RLP processor, and in response, the transmitting RLP processor retransmits the failing RLP frame assigned with the requested new identifier instead of the original sequence number (Chang, Abstract). Thus, in Chang, it is the RLP, or link control layer, of the receiver that detects a lost frame and requests the transmitting RLP processor to retransmit the lost frame (See Chang, Abstract, col. 4, lines 33-51; and col. 6, lines 12-59). Chang does not teach detecting a failed attempt to transmit a frame **at a physical layer of a receiver**, and then sending a message from the physical layer of the receiver to a link control layer of the receiver to indicate the failed attempt to transmit a frame has been detected, as claimed in the present invention.

Claim 1 recites a method for initiating retransmission of frames comprising:

- a) detecting a failed attempt to transmit a frame at a physical layer of a receiver;
- b) sending a message from the physical layer of the receiver to a link control layer of the receiver to indicate the failed attempt to transmit a frame has been detected; and
- c) upon receipt of the message, sending a retransmission message from the link control layer of the receiver, the retransmission message configured to cause a sender to retransmit data associated with the frame.

Chang does not teach “detecting a failed attempt to transmit a frame **at a physical layer of a receiver**,” as recited in claim 1. Instead, Chang discloses that the RLP controller 131 of receiving RLP processor 310 determines whether the received RLP from the MUX/DEMUX controller 140 contains new data or retransmitted data. If new data is detected, the RLP controller 131 stores the received RLP frame into the receiving data buffer 124 provided there is presently no lost or failing frame. However, if there is a lost frame, the RLP controller 131 requests the transmitting RLP processor to retransmit the lost frame, and stores the received RLP frame into the rearranging buffer 139 (Chang, Figure 4; col. 4, lines 33-51). Thus, the RLP controller detects whether there is a lost frame and if so, requests that the transmitting RLP processor retransmit the lost frame. The RLP controller 131 is part of the RLP processor 310, which the Patent Office has alleged to be the link control layer (See Office Action mailed May 4, 2007, p. 4). The RLP controller 131 is not part of the mux/demux controller 140 and physical layer processor 150, which the Patent Office has alleged is the physical layer. Thus, since the RLP controller 131 detects whether there is a lost frame and the RLP controller is not part of the physical layer, Chang does not teach or suggest “detecting a failed attempt to transmit a frame **at**

a physical layer of a receiver,” as recited in claim 1. Accordingly, since Chang does not teach this element, Chang cannot anticipate claim 1.

Likewise, Chang does not teach “sending a message from the physical layer of the receiver to a link control layer of the receiver to indicate the failed attempt to transmit a frame has been detected,” as recited in claim 1. The Patent Office alleges this limitation is taught at col. 6, lines 12-36 of Chang (Office Action mailed May 4, 2007, p. 4). Applicant has reviewed the cited portion of Chang and finds no mention of a message being sent from the physical layer of the receiver (asserted by the Patent Office to be the mux/demux controller 140 and physical layer processor 150) to the link control layer of the receiver (asserted by the Patent Office to be the RLP processor 310). The cited portion of Chang does mention a request by the RLP processor to retransmit a frame; however, this is not a message **from the physical layer of the receiver to a link control layer of the receiver** to indicate the failed attempt to transmit a frame has been detected, as recited in claim 1. Since Chang does not disclose “sending a message from the physical layer of the receiver to a link control layer of the receiver to indicate the failed attempt to transmit a frame has been detected,” as recited in claim 1, Chang does not teach each and every element of claim 1. Claim 1 is thus not anticipated by Chang.

Claim 1 also recites “**upon receipt of the message**, sending a retransmission message from the link control layer of the receiver. . .”. The message in question is the message from the physical layer of the receiver to a link control layer of the receiver (see element b of claim 1). The Patent Office opines that the quoted language is taught by Chang at col. 4, lines 33-51 (Office Action mailed May 4, 2007, p. 4). However, since Chang does not disclose “sending a message from the physical layer of the receiver to a link control layer of the receiver to indicate the failed attempt to transmit a frame has been detected,” as discussed above, Chang cannot teach sending a retransmission message from the link control layer of the receiver **upon receipt of the message** from the physical layer of the receiver to a link control layer of the receiver. Column 4, lines 33-51 of Chang does disclose the RLP controller of the receiver detects if there is a lost frame and if so, the RLP controller requests the transmitting RLP processor to retransmit the lost frame. However, there is no discussion of receiving a message at the link control layer from the physical layer of the receiver and then upon receipt of that message, sending a retransmission message from the link control layer of the receiver. Instead, in Chang, the RLP layer simply detects whether there is a lost frame and then requests retransmission. There is no

message from the physical layer to the link control layer of the receiver that prompts the link control layer of the receiver to send a retransmission message. Chang requests retransmission upon the RLP controller detecting a lost frame, not **upon receipt of the message** from the physical layer of the receiver to a link control layer of the receiver. Accordingly, Chang does not teach or suggest “**upon receipt of the message**, sending a retransmission message from the link control layer of the receiver. . .”. Since Chang does not teach each and every element of claim 1, claim 1 is thus not anticipated by Chang.

Claims 2-5 and 7-9 depend from claim 1 and are not anticipated for at least the same reasons. Applicant requests withdrawal of the § 102(e) rejection of claims 1-5 and 7-9 on this basis.

Independent claims 10 and 19 recite similar elements and are not anticipated for at least the same reasons. Dependent claims 2-5, 7-9, 11-14, 16-18, 20-23, and 25-30 depend directly or indirectly from one of the independent claims and further define patentable subject matter. Thus, these dependent claims are patentable for at least the same reasons set forth above with respect to claim 1.

Claims 28-30 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Chang in view of U.S. Patent No. 6,718,500 B1 to Lee et al. (hereinafter “Lee”). Applicant respectfully traverses. To establish *prima facie* obviousness, the Patent Office must show where each and every element of the claim is taught or suggested in the combination of references. MPEP § 2143.03. If the Patent Office cannot establish obviousness, the claims are allowable.


Claims 28-30 depend from claims 1, 10, and 19 respectively, and all recite the limitation “wherein the message is a primitive indicative of a failed attempt to receive frames in the physical layer.” This limitation was present in claims 6, 15, and 24 as filed with the original application. The Patent Office indicated these claims were allowable over Chang and Lee in the first Office Action (see Office Action mailed August 22, 2005, p. 6). The Patent Office admits that Chang fails to disclose this limitation, but now alleges that column 2, lines 38-65 of Lee discloses a method to receive indication of a failed attempt to receive frames in the physical layer (Office Action mailed May 4, 2007, p. 6). Applicant submits that the Patent Office’s initial ruling that Chang and Lee did not teach “wherein the message is a primitive indicative of a failed attempt to receive frames in the physical layer” was correct. At best, the cited portion of Lee merely states that the “physical layer of a receiving side informs a radio link protocol that no

physical frame has been received.” (Lee, column 2, lines 53-56.) However, the cited portion of Lee does not mention a message at all and therefore does not teach or suggest “sending a message from the physical layer of the receiver to a link control layer of the receiver to indicate the failed attempt to transmit a frame has been detected.” Certainly, Lee does not teach or suggest “wherein the message is a **primitive indicative** of a failed attempt to receive frames in the physical layer.” A primitive indicative of a failed attempt is discussed in paragraph 0024 of the Specification: “For the latter scenario, the physical layer 38 can send a primitive, or like signal, to the RLP entity 44 to inform it that an attempt to transmit a frame was made, but the frame was not properly received. An existing primitive capable of providing such information is the primitive used to calculate frame error rates and ultimately control transmit-power levels.” Lee does not disclose a primitive, and thus does not teach or suggest using such a primitive as a message sent from the physical layer of the receiver to a link control layer of the receiver to indicate a failed attempt to receive frames in the physical layer, as recited in claims 28-30. Accordingly, Lee does not teach each and every element of claims 28-30. Claims 28-30 are therefore patentable over Lee and Chang.

The present application is now in condition for allowance and such action is respectfully requested. The Examiner is encouraged to contact Applicant’s representative regarding any remaining issues in an effort to expedite allowance and issuance of the present application.

Respectfully submitted,

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